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JULY 15, 1950

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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See Page 20

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## GENERAL SCIENCE

# Scientists to Be Drafted?

**It is hoped that scientific talent will not be misused due to the draft. Draft boards now decide if a man is essential.**

► SCIENTISTS hope Selective Service this time will put no scientists or promising science students on KP. They remember misuse of scientific talent during World War II and, in light of the much greater need for full utilization of our science brain power today, they hope Selective Service and the Armed Forces have learned their lesson.

Putting it most politely, Dr. Detlev W. Bronk, president of the National Academy of Sciences, expresses the hopes of scientists this way: "The administration and Congress have during the past years wisely recognized the important role of science and scientists in the maintenance of our military strength and security. They have given strong support to scientists in their efforts to prepare for such an emergency as this. Accordingly, I am confident that the draft act will be administered in such a way that our scientists will be utilized where they can most effectively serve our country. I am confident too that the training of scientific students who will be necessary for the security and welfare of our nation will not be interrupted."

As of now, there is no special provision for scientists or scientific students in the draft law or in selective service regulations. It is up to the local boards to decide whether a man is in an essential occupation. Either the prospective draftee or his employer or, if he is in college, a college official, can ask for deferment. Many scientists who are otherwise eligible for the draft are reluctant to ask for deferment. They feel they should be ordered to do the work for which they are most fitted and which is most valuable to the nation.

Early in 1949, a study made for the General Staff of the Army with the cooperation of nearly 5,000 veterans who were scientists, declared that, if these 5,000 soldier-scientists had their way, the present selective service system would not have jurisdiction over the utilization of scientists in the armed forces in another emergency. Over half the 5,000 strongly advocated some national agency to allocate and assign the scientists to jobs; they could best do in war, whether in uniform or civilians.

Maj. Gen. A. C. McAuliffe—of Bastogne fame—declared in the report: "Scientists constitute an exceedingly small segment of the national population. They compose less than 2 per cent of the Armed Forces, but the military functions dependent on their specialized skills and knowledge are highly disproportionate to their num-

bers. The small numbers involved and the great complexity of scientists' experience and training require the use of special measures to assure their maximum utilization."

Gen. McAuliffe, at the time, was deputy director of the Army's research and development.

Although there is no deferment for students in the medical field, a memorandum has gone out to local boards advising them that students in medical, dental, veterinary and osteopathic fields are in a class where there is a shortage. Physicists, chemists, engineers and students in those vital fields do not even have this protection.

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## GENERAL SCIENCE

## Korea, Oft Invaded, Was Cultural Bridge

► AT the entrance of many country towns in Korea can be seen curiously carved posts, representing the Five Point Generals. These Generals are supposed to prevent the entry of evil spirits from the five points of North, East, South, West and Center. It must be said that the Generals have not done too good a job for Korea down through the ages.

Korea is a land of 86,000 square miles and about 25,000,000 people. Less than half the land is below the 38th parallel, which divides the Russian-sponsored North Korean Republic from the American-sponsored South Korean Republic. But more than two-thirds of the people live below that crucial parallel.

Koreans are presumed to be of the Mongol family although no one is quite sure. There have been additions to the original stock of both Caucasian and Malayan strains. They are distinct from both the Chinese and Japanese in looks.

Korean history began with somebody named either Dan Koon or Tangun, who began his rule of the country in either 2257 B.C. or 2333 B.C. He founded a dynasty which lasted 1050 years. He taught the uncivilized people of Korea agriculture and the art of building and introduced the beginnings of a religion.

There was no name for the whole peninsula in those days. It received a name which probably sounded something like Chosen when Ki-tze emigrated from China with several thousand followers. He founded a dynasty which lasted another thousand years. The name Korea is derived from the

Koryu dynasty which lasted from 918 to 1392 A.D.

During all this time, the influence of China on the culture of the Koreans was quite marked. Literature of the higher class was exclusively in Chinese characters, although an ingenious 25-letter alphabet with 11 vowels and 14 consonants was developed for everyday use.

The Koreans were a sort of bridge for the transmittal of culture and religion from China to Japan. The Japanese paid for these favors by trying to conquer the land, beginning with pirate raids and then in 1592, staging a 300,000-man invasion.

This invasion would have succeeded had not the Koreans produced an admiral with a little of Sir Francis Drake in him and a flair for inventions. This admiral, Yi Sun Sin, invented the first iron clad naval ships. They looked like turtles, propelled by oars, and fire arrows emanated from port-holes in the sides. With these ships, the Admiral cut the Japanese invaders off from their transports and finally routed and destroyed the Japanese navy. The Koreans did not see the Japanese again for 300 years.

Korea is a mountainous land, with very few plains worthy of the name. Everybody says its climate is delightful, although there is a rainy season which lasts through July and August.

Most of its rivers are shallow and rocky. The Han, however, which just about bisects the country below the 38th parallel, can be navigated for 150 miles.

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## MEDICINE

## Two Modern Drugs Fail in Polio

► HOPE that an effective treatment for poliomyelitis might have been found in two modern drugs is dispelled by reports to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 10).

The drugs are the sulfa drug, phenosulfazole, also called darvisul, and the antibiotic, aureomycin.

Phenosulfazole was given to 29 patients with bulbar and spinobulbar polio during the 1948 epidemic in Milwaukee. The mortality rate in this group was 34.5%, compared to 42.1% in a group of 19 similar patients who did not get the drug. Reporting this, Drs. Max J. Fox and Evans Z. Hornberger, Jr., state that the difference is not statistically significant and that there appeared to be no difference in the length of time the patients had fever and had to stay in the hospital.

The aureomycin trials are reported by Drs. Emanuel Appelbaum and Raymond Saigh of New York. The drug was given to 38 patients with nonparalytic polio, 66 similar patients not getting the drug and serving as controls. The results were about the same in both groups of patients. The drug did not seem to affect favorably the clinical course of the disease.

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## MILITARY SCIENCE

# War Weapons in Korea

Korean fighting techniques are not utilizing discoveries of World War II. However, new weapons may soon make tank warfare obsolete.

## See Front Cover

► WARFARE in Korea came too early for the scientific promises of new defense weapons to be fulfilled. Secretary of the Army Frank Pace, Jr., speaking at West Point's commencement in June, declared: "With guided missiles and rockets, target-seeking equipment and the possibility of tactical use of atomic weapons, it may well be that tank warfare as we have known it will soon be obsolete."

The North Koreans, with their tank-led advances, are now proving that "tank warfare as we have known it" is not yet obsolete.

The Korean war, in fact, has used little even that was learned by scientists during World War II. The retreat of the South Koreans dates back more to the rout of the French in 1940 than to the end of World War II.

Even the fast jet planes, developed largely since the end of World War II, have proved unsuitable both in ground support of the South Koreans and in combat against the much slower Russian Yaks.

The problem seems to be not whether our side is taking advantage of the scientific advances in warfare since 1945, but whether our side can use to any advantage at all the weapons that are available.

Bazookas—recoilless weapons easily manageable by one or two infantrymen—were developed during World War II. They are said to be extremely effective against tanks. The United States turned over to the South Koreans more than 2,000 anti-tank bazookas with 40,000 rounds of ammunition when American troops left a year ago. Their presence in South Korea had little effect on the first advances of North Korean tanks. The question seems not to be whether they were effective but whether they were used at all by the South Koreans.

Early in June the Army Department determined on a policy of revealing some of the scientific advances in new defensive weapons, hoping thereby to bolster the morale of western Europe. It was said that, with these new defensive weapons, in time western Europe could defend itself against the superior manpower of Soviet Russia.

The weapons mentioned included guided missiles, atomic warheads in artillery, 75 millimeter recoilless weapons, as shown on this week's cover of SCIENCE NEWS LETTER, new versions of the bazooka. One of the results of this war may well be to speed

up development and production of these new defensive weapons.

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## AERONAUTICS

## Missile Models Give Data Of 6,000-Mile Speed

► WRAPS were removed at Moffett Field, Calif., from a new and unusual wind tunnel in which tiny models of missiles are fired from guns against a powerful air current to provide the equivalent of speeds of some 6,000 miles per hour.

The new installation, known as a supersonic free-flight wind tunnel, is at the Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics. Additional equipment to be installed will permit aerodynamic studies up to 11,000 miles per hour, approximately 15 times the speed of sound.

The tunnel is already in use to study the characteristics of missile-type models at

high supersonic speeds. The models used are only a few inches in length but with this tunnel, research results obtained are comparable with those for far larger models. Conventional wind tunnels would require a model more than 10 feet long.

The hypersonic speeds in this free-flight tunnel are achieved by generating an air stream of from two to three times sonic speed and launching the model into this oncoming air stream at high velocities. Launching guns vary from .22 caliber up to three inches.

In the gun barrel, the model is housed in a tiny carrier which protects it from the hot discharge gases, keeps it properly aligned during launching and acts as a piston. Once out of the muzzle, the carrier falls away, leaving the model free to fly by itself through the tunnel.

The tunnel is of the type known as a "blowdown." The air is supplied by an adjoining 12-foot pressure tunnel at a maximum pressure of six times that of the atmosphere. The air passes through a settling chamber, supersonic nozzle, test section and diffuser and thence into the open air. Guns to fire the models are placed in the diffuser.

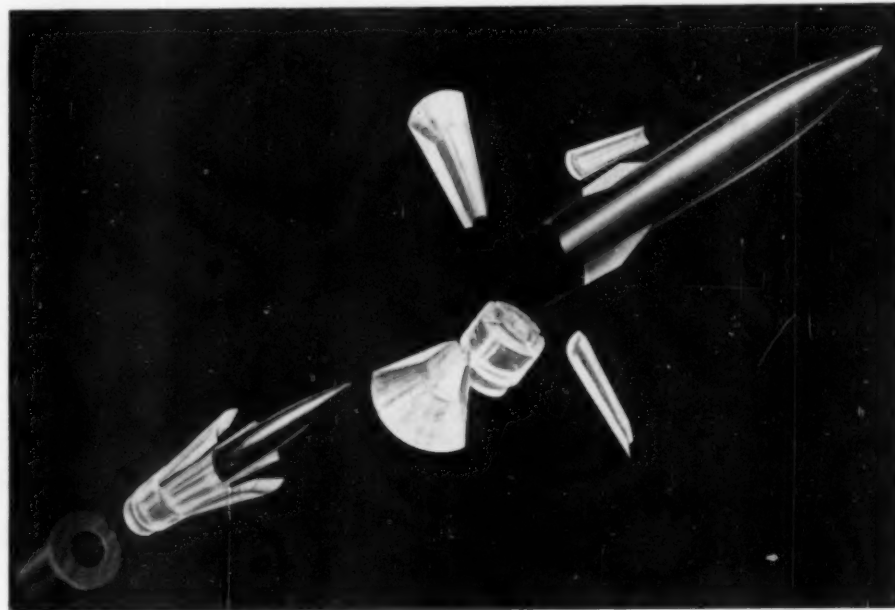
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## PHYSICS

## Say "Fishing" to Use All Speech Sources in Mouth

► SAY "fishing" and you will run the gamut of apparent sources of speech in your mouth.

Two Radio Corporation of America sci-



**SABOTS SEPARATE**—Models launched from guns in the new NACA wind tunnel leave the gun barrel in plastic "sabots" which keep the models correctly aligned and act as pistons on firing. When the model leaves the gun muzzle, the sabot separates and falls away, leaving the model free to continue its flight through the test section, where measurements are made.



entists measured the apparent location of the point sources of sound in people's mouths and came up with the tentative conclusion that the sound of "f," for instance, comes from only one-twentieth of an inch behind the lips. But the "ng" sound comes from farthest back—one and one-tenth inches behind your lips.

They made the measurements because certain microphones discriminate against sound from a distant source with respect to sound from a close source.

In all, 38 standard sounds—each ranging over 18 frequency bands—were measured. It was found that the unvoiced consonants like "f," "k," "p," "h" and "t" come from closest behind the lips; vowels are mostly in the middle, from a half to three-quarters of an inch back; and semi-vowels, like

"a" as in pan and "o" as in pole are farthest back.

"Ng" seems to be an exception to all the rules. It is farthest back but, instead of retreating into the mouth as the frequency of the sound rises, as most other sounds, it gets closer to the lips.

According to the data in this study, the sound of "Truman" comes from a greater area in your mouth than the sound of "Dewey."

The scientists are Mones E. Hawley and H. H. Kettler of the government sound engineering section of RCA's Victor Division. Their study was published in the JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA (June 6).

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and adjusting computations until the desired design change is produced on the plotting board.

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## RADIO

Saturday, July 22, 1950, 3:15 p.m., EDST

"Adventures in Science" with Watson Davis, Director of Science Service, over Columbia Broadcasting System.

Mr. Davis will continue his discussion "Our Atomic Future."

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### MATHEMATICS-ENGINEERING

## Giant Brains Shrink

► "GIANT brains" are shrinking in size but not in efficiency. The newer complicated electronic computers, that solve mathematical problems in seconds that otherwise might take weeks or months, require less space and cost less money.

One of the newest, office-size, "tests" equipment even before models are made. It is the REAC. Spelled out, it is the Reeves Electronic Analog Computer.

It was developed by Claude Neon, Inc., in its research center, the Reeves Instrument Corporation. Harry D. Belock is the inventor. It is an outgrowth of U. S. Navy guided missile work and, while relatively new, is already in production and in use in aircraft and other laboratories.

The role of the REAC in industry and science, ranging from aircraft to television, is that it makes economically feasible the solution to a wide range of the most intricate mathematical problems. In the automotive field it solves problems with respect

to internal combustion engines in performance, ignition and carburetor development work and improvements in a car's riding ability.

In engineering it computes problems with respect to bridge vibrations, stress analyses and many other matters.

The REAC specialty is solving what mathematicians know as differential equations. The equations used usually describe the motion of a body in space, motion of the links in a mechanism, and the like, as a function of time. Their solution results in an accurate picture of the particular dynamic motion under a desired variety of conditions.

The standard REAC, in appearance, looks like any conventional type of telephone switch board. It consists of a computer unit, a servomechanism unit, a recording unit and an associated power supply. Equations are plugged into the board. This simple method facilitates changing equations

## Question Box

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Photographs: Cover, U. S. Army; p. 35, National Advisory Committee for Aeronautics; p. 39, U. S. Army; p. 48, Bell Telephone Laboratories.

## MEDICINE

# Banthine for Ulcers

This chemical effectively treats even peptic ulcers of long standing. General distribution of the drug is now planned in order to make general use possible.

► ULCERS of the stomach can be treated successfully without surgery through use of a new chemical, called banthine.

Even peptic ulcers of considerable severity and long standing were relieved and healed by banthine doses in the clinical trial reported by a team of Duke University physicians to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 8).

The effect on symptoms of patients using banthine, usually four doses by mouth a day, has been "gratifying," Drs. Keith S. Grimson, C. Keith Lyons and Robert J. Reeves report. The treatment promptly relieves the pain of ulcer and those originally incapacitated, with only two exceptions, returned to regular work.

In the test series of a hundred patients, 50 of the 55 who would conventionally require surgery have not required an operation. Of 38 patients with duodenal ulcer without indications for surgery, 34 are now able to eat regular food.

Banthine, the drug used in the ulcer

treatment, is a quaternary ammonium compound with the long chemical name of beta-diethylaminoethyl xanthene-9-carboxylate; and it is used as the methachloride or methabromide. Because of the encouraging

## MEDICINE

## Tools Help Blind See

► ELECTRONIC pencils which "read" to blind people, a typewriter which communicates with the deaf-blind, a magnifier based on television principles, these are some of the instruments shown in Philadelphia to a research session of the American Association of Instructors for the Blind.

Many of the new tools to help the blind "see" are complicated arrays of electronic tubes and some of these have not yet been perfected. But a simple attachment to a typewriter, without any electronic tubes, enables a person who can type to talk with

results obtained in the Duke Medical School tests, general distribution of banthine is planned in order that physicians may now use it. The drug is produced by G. D. Searle & Co., Chicago.

The usual schedule used by the Duke doctors in treating ulcer patients was 100 milligrams every six hours day and night. After three to eight weeks when healing has occurred, patients decrease the amount of banthine taken to 50 milligram doses, or 200 milligrams a day, continuing this indefinitely. They go back to larger doses if pain again develops under tension, strain or illness.

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any deaf-blind person at the speed he can type.

The attachment is a little box containing a reel on which are printed the Braille characters. The blind-deaf person places his finger on a hole in the top of the box and as his friend types a letter on the typewriter, it is brought up to the hole and the blind-deaf person "reads" it with his finger.

The instrument was developed by the technical research division of the American Foundation for the Blind.

Three "guidance" devices which use the techniques of radar to warn blind persons of obstacles were demonstrated. However, the demonstrators emphasized that all the devices are still in the experimental stage and need a great deal of work before the average blind person can use them.

The results of tests with a "reading pencil" developed by Dr. Vladimir Zworykin of the R. C. A. Laboratories were reported to the session by a member of the staff of the Institute for Human Adjustment at the University of Michigan, Dr. Emily Willerman. She and Dr. Wilma Donahue found that, with the pencil, a blind person can learn to read ordinary print and typewritten copy.

The pencil, pointed at a letter, translates the shape of the letter into a distinctive noise which is heard by the blind person through a hearing aid.

Changes in type, however, are confusing and it usually takes additional instruction when the style of type is changed. In about 25 hours, the average blind person can achieve a vocabulary of about 190 words which can be read in sentences.

The first experimental model of an electronic magnifier for almost blind persons, demonstrated at the session, was based on television principles. A small oscilloscope, in an instrument about the size of a flashlight, scans the type to be magnified and it is then transmitted to an ordinary tele-



**READING PENCIL**—Nancy Bradley, 8, Kenwood, Pa., who was totally blinded in a sledding accident when she was five, tries out an electronic stylus, a "reading pencil," developed by R.C.A. The pencil translates letters in a line of type into recognizable sounds. Dr. Emily Willerman, of the University of Michigan, shows Nancy how to operate the mechanism.

vision screen. It magnifies 15 times, which means that about three letters would fit on a five-inch television screen.

Developed at the Franklin Institute, from stock parts, the demonstrators stressed that many factors have yet to be worked out

## PHYSICS-CHEMISTRY

## Atoms Make Direct Picture

► **EXPLODING** atoms that set off a "chain reaction" in your camera, giving you a direct print of the picture you are taking, are promised from a new light-sensitive process just announced.

This direct photo print-out paper will be commercially possible when some way is found to make stable the chemical, nitrogen iodide. This is the light-sensitive compound that has been found to do the trick usually done by a silver chemical.

A photo-print is made when a light flash hits paper that has been coated with small amounts of a light-sensitive chemical. Dr. J. Eggert, of the Photographic Institute of the Eidgenossischen Technischen Hochschule in Zurich, discovered that nitrogen iodide is a very efficient photo-chemical. For his most valuable contributions to photographic science Dr. Eggert was presented the Progress Medal for the years 1949 and 1950 of the Royal Photographic Society of England.

When nitrogen iodide is coated on paper in very tiny amounts and then exposed to a high intensity light flash, the tiny particles explode, making the photo-print. This process is 1000 times faster with nitrogen iodide than when ordinary print-out paper is used.

Although commercial development of the process must wait until nitrogen iodide can be made more stable, pictures using nitrogen iodide finely dispersed on paper

before it can be determined whether the magnifier is practicable.

The meeting was held at the Franklin Institute with Dr. Gabriel Farrell, director of the Perkins Institution, Watertown, Mass., as chairman.

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have been made experimentally. The paper looks black before the print. Where each unit of light energy, or quantum, explodes the particles of nitrogen iodide, the paper turns white.

This process is highly efficient, since each quantum of light explodes more than one molecule of nitrogen iodide. Or, as Dr. Eggert reported to the third international conference on "Fundamental Mechanisms of Photographic Sensitivity," the "primary quantum efficiency of nitrogen iodide as a photo-chemical is much better than one." Just how efficient it is depends on the amount of the chemical that is dispersed on the paper.

The keeping quality of the photo-prints made by this process is limited to a day or so, Dr. Eggert reports. The image can, however, be converted to a silver one that then keeps as long as normal prints.

The photographic quality of the prints now being made experimentally is similar to that obtained by Xerography at the time that process was disclosed in October, 1948. Xerography is a completely dry process for taking and printing pictures.

Although it has been known that nitrogen iodide was unstable to heat and that it explodes under mechanical pressure, Dr. Eggert's researches have proved that the quick change in the chemical when exposed to a light flash is not due to the heat of the flash.

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will look at them, admire them, and so be helped in remembering.

If the left-handed child is old enough to go to school and learn to write, the problem of training him in right-handedness is a little different. Whether he should be changed over depends, advises Dr. Hildreth, on how fixed his left-handed habits have become and whether the re-training will cause nervous tension. After a child has been writing in school for a year or more with his left hand it is usually too late to re-train him.

But he should not be left to "nature." If it is decided that he is to be left-handed, then he should be given special training so that he will write well with his left hand. Start him at the blackboard, not with paper, Dr. Hildreth advises. If he stands at the extreme left end of the board to start his writing, there will be no temptation to write backwards, mirror-fashion. And he will not be likely to crook his wrist around at an awkward angle. This is done by the left-hander writing on paper so that he can see what he is writing.

When he starts writing on paper, give him a pencil, not a pen, to work with and turn his paper at an angle the reverse of that used by the right-hander. A slope-top desk is a help.

If a child or an adult loses the use of his right hand it is not too difficult to train him to use the left. War veterans have been taught left-handed writing in five to ten days. Teach the child to use his left hand first to tap with a hammer. Then he should follow the edges of openings cut out like a stencil in a sheet of copper. Later he should practice on the blackboard and finally on paper.

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## ENTOMOLOGY

## Fly Destroys Central American Corn Crops

► A **FLY** which destroys whole fields of Central American corn each year, yet is little known to science, is being studied in Guatemala by experts from Iowa.

Men who know corn, researchers at Iowa State College's Tropical Research Center in Antigua, Guatemala, report the new insect pest is so destructive that it can ruin 98% of a stand of corn in a single heavy infestation.

The fly's scientific name is *Euxesta major*. It does its damage while still in the larval stage. The young worms bore down into the growing cornstalk and either kill the stalk outright or leave it dwarfed and bent.

The fly maggot is currently at work, it is believed, from Costa Rica north to Mexico. U. S. Department of Agriculture specialists say there is no indication that *Euxesta major* exists in the United States.

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## PSYCHOLOGY

## Train Baby's Right Hand

► **MOTHERS** should not leave it to "nature" whether the baby is to become a "southpaw" or right-hander. The mother should train her baby to right-handedness beginning in the cradle or high chair.

This is the advice of Dr. Gertude Hildreth, of Brooklyn College, psychologist who has made a special study of handedness and its effect on stuttering and other defects.

No baby is born left-handed, she reported in the *JOURNAL OF GENETIC PSYCHOLOGY* (March). The little baby will pick up objects with either hand or both. Right- or left-handedness is the result of training, conscious or unconscious.

The training should be unobtrusive and no mother should make a scene and grab

a toy away from the baby who has taken it in his left hand. Nevertheless, she should be persistent in encouraging use of the right hand. When you give a baby a toy, put it in his right hand. When he learns to feed himself, have him hold his spoon in his right hand. Place articles that he is going to use on the baby's right. Put the crayon in his right fist.

It is no use to tell a child, "Use your right hand," Dr. Hildreth warns. In the first place, the training should be done before the child is able to talk. In the second place a child under six cannot be expected to know right hand from left. If you want him to remember, put a bright ribbon on his right arm, or give the little girl a pretty bracelet to wear on her right wrist. They



## MEDICINE

# From Now On: Viruses

Colds and influenza may succumb to science in the future. Synthetic viruses may afford devastating weapons of ruthless warfare.

By WATSON DAVIS

*Sixteenth in a series of glances forward in science.*

► THE causes of influenza, infantile paralysis, the common cold and a number of other common and uncommon human diseases are viruses. These organisms, tiniest of the disease troublemakers, are the least conquered as a general group.

It used to be said that the viruses were invisible and that they could be recognized only by their evil deeds and their ability to pass through small space that would stop a bacterium. That is no longer true, for the electron microscope has allowed us to "see" a variety of shapes and forms that are evidently organisms that cause these diseases.

While some of the newer disease-treating drugs, such as aureomycin, seem to be effective against some of the virus-caused ills, such as virus pneumonia and parrot fever, the viruses that cause flu, polio and colds, to pick the most prominent, have not yet been conquered chemically.

Much research is being done on the viruses, but the blind alleys are many and the difficulties are complex. Much of the exploratory work has been done on plant diseases, many of which are virus-caused. But there is no assurance that many things learned through use of sick tomato plants will do more than furnish good leads.

There has been the intriguing possibility that cancer—or at least some forms of it—may turn out to be a virus disease. Some cancer-like diseases in animals certainly are. Smallpox is caused by a virus, but since it is prevented by vaccination there is less incentive to work on it. Among other virus diseases are mumps in humans and Newcastle disease of fowls.

A virus is, of course, a parasite, just as are bigger germs. It has to multiply in the cells of the body it invades, it must travel from one sick person to another and it must be able to persist in its invasion of the host.

Epidemic influenza is perhaps the most dangerous of the viruses, although the common cold would surpass it in the lost time and human misery that it causes.

The great pandemic of influenza of 1918-19 has not been repeated, but this may happen in the future. Dr. C. H. Andrewes, the British virus authority, observes that influenza seems to be a megalomaniac virus that likes to operate on a world-wide scale. He suggests that civilization, with its air travel that mixes up all peoples and their

viruses, may keep our immunity to influenza so high that another world epidemic will be avoided.

In the virus situation, the cold war between the East and the West would not seem too important. Yet Dr. Andrewes suggests that if political troubles cause a further division of the world into two separate camps, different strains of influenza might become dominant in each half. In that case, the Soviet and the Western viruses having no political preferences, might each seize the opportunity to conduct a natural biological warfare.

As to the viruses in our future, we may expect:

A. The possible development of new chemicals that will treat or prevent some of the unconquered virus diseases, even influenza and the common cold. A new antibiotic or other chemical may be found to tackle successfully several viruses, or specific chemicals may be produced for each disease.

B. New kinds of synthetic viruses may be devised once scientists know enough chemically about the natural ones, and these might create dangerous disease weapons in ruthless warfare, which would be slower but perhaps more devastating than atomic bombs.

C. Understanding the viruses, that are

often considered to be on the borderline between the living organisms and non-living chemicals, may throw light upon the nature of life itself.

Science News Letter, July 15, 1950

## ENGINEERING

## Pumps Supply Fuels to Forward Combat Areas

► LIQUID fuels for military operations in forward combat areas will be more certain with two improved portable pumps developed in Fort Belvoir, Va., by the Army Engineer Research and Development Laboratories. They are usable also for a water supply system.

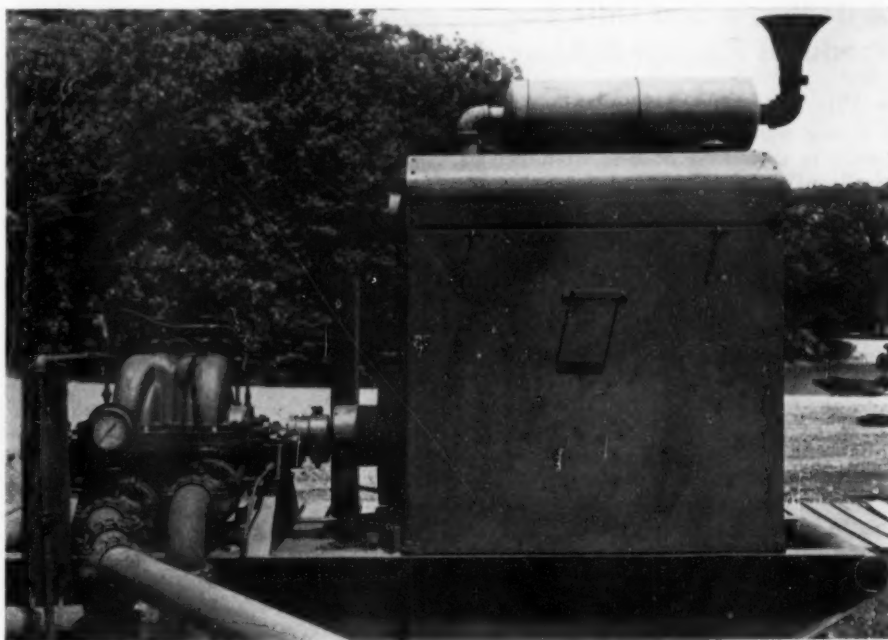
They are said to be dependable pumps and capable of continuous duty. Both are centrifugal affairs, one a two-stage and the other a four-stage pump, that can be used singly or in series up to three units.

The capacity range is from 10 to 2,800 gallons per minute at pressures up to 200 pounds per square inch. When operated in series, a pressure of 600 pounds per square inch can be obtained. This range meets all bulk petroleum handling requirements.

The higher capacity two-stage pump weighs 4,700 pounds. Continuous duty on six- and eight-inch Army pipelines was the primary requisite in its design. When operated on overland pipelines, capacities are 500 to 900 gallons per minute, with 20-mile station spacing over level ground.

Threadless shafts and horizontally split casings give increased dependability and simplification of maintenance.

Science News Letter, July 15, 1950



**FUEL FOR FRONT LINES**—Centrifugal pumps, for army pipelines, gasoline engine driven, will provide forward combat areas with liquid fuel.

## MEDICINE

**Dicumarol Prevents Dangerous Blood Clotting**

► USE of a drug that prevents the blood from clotting so readily gives promise of being a good routine way of keeping heart patients, suffering from rheumatic heart disease and auricular fibrillation, from attacks of dangerous blood-clots or emboli.

Dicumarol is the drug that was used for this purpose in 18 patients by Dr. Stuart W. Cosgriff of College of Physicians and Surgeons of Columbia University and Presbyterian Hospital, New York, who reports in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 8).

Continuous dicumarol anti-coagulant therapy was used for as long as two years in some patients. This seemed to prevent recurrent attacks of the blood-clot difficulty.

Dr. Cosgriff believes that this treatment could be applied to those suffering from arteriosclerosis as well.

Science News Letter, July 15, 1950

## AGRICULTURE

**World Sweet Tooth: Record Sugar Production**

► THE world's tooth is growing sweeter. A new all-time record of world sugar production is in the offing, reports the U. S. Department of Agriculture's Office of Foreign Agricultural Relations. Expected output for the 1949-50 growing season is 37,999,000 tons, two percent more than last year's record crop.

Science News Letter, July 15, 1950

## ENTOMOLOGY

**A Beetle, a Bad Little Bug, Produces Russian Bellows**

► THE cold war is obsolete. Now it is the bad bug war. A squat, zebra-striped little beetle is producing bellows from behind the Iron Curtain.

On June 30 Russia handed the U. S. ambassador in Moscow a formal charge that American planes have been dropping Colorado potato beetles over Eastern Germany.

The State Department replied that Russia's charge was "one of the most fantastic fabrications that has ever been invented by one government against another." Russia is trying to cover up its own failure to control the ravenous, destructive potato pest, the U. S. said in blunt terms.

There is little doubt that the potato beetle emigrated from this country to Europe—but it made the voyage in 1918, traveling with the A. E. F. in World War I.

By 1924 it was a serious enemy in French potato fields, and stood at the Rhine with its feelers toward Germany. By 1939, the Germans had been at war with the striped

potato beetle for years. Hitler was the first to scream at the Allies, "Stop dropping potato bugs," the U. S. pointed out to Russia.

Actually, if this country were so minded, it could get into the bug propaganda business itself, with as little justification as the Soviets.

The codling moth that eats our apples came from southeastern Europe. From across the Atlantic came the gipsy moth, and the ox warbles which attack steer hides. We pick up a \$350,000,000 bill for damages each year because of the European corn borer. The boll weevil, ruinous cotton pest, came from Mexico. We have a tenacious parasite called the Japanese beetle.

Science News Letter, July 15, 1950

## MEDICINE

**Female Sex Hormone Relieves Advanced Cancer**

► A NEW method of using female sex hormone to relieve men and women patients with far-advanced cancers was reported by Dr. Roy Hertz of the U. S. National Cancer Institute and George Washington University Cancer Research Service, Washington, D. C., at the meeting of the American Medical Association in San Francisco.

"Significant" results in five prostate cancer patients and five breast cancer patients have been obtained. In the prostate cancer patients these good results included a rapid reduction in the size of the cancer, relief of severe bone pain, and general improvement in weight, appetite and feeling of well being.

In the breast cancer patients the good results included prompt and marked shrinking of the visible breast cancer, marked suppression of the fluid in the chest, decisive relief of pain from cancer spread to bones, reduction in the size of the cancerous lymph nodes, and general rehabilitation of the patient.

The good results, Dr. Hertz and associates believe, come from the size of the dose of hormone given. A big dose in itself, however, is not enough, Dr. Hertz emphasized. The important factor is the amount of hormone that stays in the patient's blood. And the hormone disappears from the blood rather fast after an injection of even a big dose.

With this in mind, Dr. Hertz and associates worked out the new method of giving the hormone. This consists in continuous dripping of hormone solution into the veins or under the skin, using a special plastic tube for the purpose. The infusion, or continuous dripping, of hormone into the patient goes on for hours. In one patient this infusion was given continuously for 72 hours. Others have been for 12-hour periods.

The work is still in the experimental stage.

Science News Letter, July 15, 1950

**IN SCIENCE**

## MEDICINE

**Metrazol for Sleeping Tablet Suicide Attempts**

► IN case of attempted suicide by sleeping tablets containing barbiturates, use of metrazol (pentylentetrazole) in large quantities can save many lives, Drs. John R. Murphy, James Dooley and A. Warren Jones of Knickerbocker Hospital recommend in a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 8).

A quadrupling of suicide attempts with barbituric acid derivatives in New York City justifies physicians being alert to use of metrazol treatment anywhere for immediate relief until the patient can be transported to a hospital, the doctors report.

More vigorous enforcement of the laws controlling distribution of the barbiturate drugs is urged by the report.

Science News Letter, July 15, 1950

## RADIO-ASTRONOMY

**Sunspot Color Filter To Aid Radio Predictions**

► FASTER, more accurate prediction of when radio storms may upset short wave communications will come from the use of a color filter for observing sun spots now being installed at the U. S. Naval Observatory in Washington.

Short wave radio is important for both military and commercial communication. There is usually little trouble with communication between the Far East and the United States. If there is difficulty, messages can be relayed via Honolulu to San Francisco.

In the North Atlantic region, however, the huge magnetic storms kicked up by sun spots can completely black out short wave communications.

With this new solar color filter, scientists will be able to take pictures of the sun at frequent intervals or continuously if desired. They will take these pictures in the narrow band of red light radiated by incandescent hydrogen gas. All other light is eliminated by the filter.

The filter contains ammonium dihydrogen phosphate crystals that have been grown artificially. These crystals are also used in underwater sound apparatus.

The sun spots that snarl short wave radio are sometimes large enough to be seen by the naked eye. The prominences, flamelike whirlwinds of solar fire, can be seen only by the light radiated by the gases within them. The new filter accomplishes this.

Science News Letter, July 15, 1950



# SCIENCE FIELDS

## PUBLIC HEALTH

### Urge That India's People Eat Peanuts for Health

► IF INDIA'S 400,000,000 people can be taught to eat peanuts, many of the diseases which plague that country could be wiped out.

This is the conclusion of Dr. P. K. Vijayaraghavan, biochemist from India's Nutrition Research Laboratory, who is doing special protein research at the University of California at Los Angeles.

He points out that India is starved for proteins of good nutritional value because of her traditional cattle worship. While modern Indians do not today hold rigidly to the religious beliefs which deify the animals, age-old customs have made vegetarians of them.

India's protein starvation is the basic cause of many diseases which afflict her teeming millions. Indians do not get enough proteins in their diets, either in meat or vegetables. As a result, malnutrition and dietary deficiencies are widespread.

Dr. Vijayaraghavan believes it would be easier to introduce a vegetable high in protein value—such as peanuts—into the Indian diet than to try to make meat-eaters out of his countrymen. This is the line his research at U. C. L. A. is following.

At the present time, peanuts are one of India's biggest crops. However, most of the crop is fed to cattle. Dr. Vijayaraghavan is convinced that if Indians can be induced to eat peanuts instead of feeding them to cattle, a major battle in the war against malnutrition will have been won.

Science News Letter, July 15, 1950

## METEOROLOGY

### Scientists Disagree on Whether Rain Calms Sea

► RAIN falling upon an angry ocean either helps calm the waves or it does not. British scientists—armed with tanks of water and apparatus to make measured drops fall into the tanks—are arguing out this point and coming up with varying answers.

Latest blow in the battle of the raindrops was delivered by G. L. Sainsbury and I. C. Cheeseman of Andover, Hants. They say raindrops have little, if any, effect on waves, despite what British scientists Osborne Reynolds and C. F. Barnaby say to the contrary.

Supporting the earlier conclusions of E. W. S. Ashton and J. K. O'Sullivan of the University of Manchester, Messrs. Sainsbury and Cheeseman cite their experiments in

dropping measured particles of liquid dye from varying heights into a tank of water. They claim that the greater the height from which a drop falls, the more likely is its energy to be dissipated on the surface of the water, therefore having little effect on the wave movement.

Their opponents say drops of rain produce a vortex which goes down under the surface, thus tending to calm down the waves.

The controversy is being carried on in the letter column of the British scientific journal, NATURE (July 8).

Other scientists, including Americans, say that the effect of a calming of the sea when it rains is due either to a change in the direction or the lessening of the force of the wind.

Oceanographer Boyd Olson with the U. S. Navy's Hydrographic Office says he does not think experiments with laboratory tanks of water can be conclusive because in the tanks the Britishers cannot demonstrate the effect of the momentum of the waves and the velocity of the particles of water in the ocean. His conclusion is that rain, by itself, would have little effect on the waves.

Science News Letter, July 15, 1950

## AGRICULTURE

### Farms Still Need Muscle Even with Weed-Killers

► THE harrow and the hoe will still be necessary down on the farm, even with effective weed-killing chemicals such as 2,4-D.

Ever since 2,4-D was introduced to U. S. cornfields after World War II, there have been predictions that cultivators and other weed-control implements would soon be obsolete. Spectacular results with the new chemical, such as eliminating weeds for the entire summer with a single application in the spring, were reported from various parts of the country.

But, say researchers at Rhode Island State College, lack of cultivation may cut corn yields as much as weeds, depending upon weather conditions. Without stirring and aerating, soil can be compacted by rain and sun almost to the consistency of brick. And some weeds can come back after a 2,4-D treatment.

A series of carefully-controlled experiments using 2,4-D with and without cultivation were carried on in Kingston, R. I. In the plots which were not touched with a cultivator, yields were less than half the normal amount.

"It seems that 2,4-D by itself is not the complete answer," says Dr. Francis B. Muller. He points out that with chemical weed control, a certain amount of cultivation will still be needed, depending upon soil and weather conditions and the stubbornness of the weeds being fought.

Science News Letter, July 15, 1950

## RADIO

### Attention Radio Tinkerers: Leave Ignitron Alone

► HUSBANDS who blithely unscrew the back of home radio sets, boasting "I can change any tube the engineers turn out," haven't heard of the new ignitron.

An electron tube which sometimes comes four feet in height, the ignitron is now being used to supply massive bursts of electricity to power modern atom-smashers. Hooked together, these tubes can serve up split-second jolts of electricity measured in thousands of volts and amperes.

Application of the new ignitrons to million- and billion-volt atom smashers was revealed in Pasadena, Calif., at the American Institute of Electrical Engineers. General Electric engineers M. J. Mulhern, C. C. Herskind and J. E. Hudson, together with J. L. Boyer and C. R. Marcum of Westinghouse, described installations of ignitrons at the University of California Radiation Laboratory, Brookhaven National Laboratory, University of Illinois, and in other units still under construction.

The tubes are used to convert high-voltage alternating current to direct current voltages needed for the bevatron and synchrotron, new types of atom smashers. Already widely used in industry at lower voltages, these new ignitrons take the place of huge direct-current generators normally needed to rectify AC power.

Pools of mercury give the surges of needed energy in high-voltage arcs. So much heat is generated by the tubes that they must be cooled by continuously-circulating water.

Science News Letter, July 15, 1950

## PHYSIOLOGY

### Calves Carry Own Vitamin Factories

► YOUNG calves carry their own vitamin factories around with them. E. M. Kesler of Pennsylvania State College reported to the American Dairy Science Association meeting at Ithaca, N. Y.

Samples of partially digested feed were taken from a calf's stomach. More thiamine, riboflavin and nicotinic acid (B-complex vitamins) were found than had originally been contained in the feed.

The exact mechanism by which the young calf turns out vitamins needed for better health is not yet known, Mr. Kesler indicated.

Calves inoculated with extracts from the cud of older cows were found to digest more food. These experiments were described by Drs. H. R. Conrad, J. W. Hibbs and T. S. Sutton of Ohio State University. Presumably, the scientists said, bacteria found in the stomachs of mature cattle are not present in young calves.

Science News Letter, July 15, 1950

## CHEMISTRY

# Food Gets Super Taste Appeal

**Chemical which has no taste of its own, stimulates mouth watering and brings out flavors. It was Oriental cooking secret.**

By ANN EWING

► A PILL that will be just as nutritious as a steak dinner, or even more so, will still have a tough battle replacing a good, old-fashioned meal with its stimulating aroma and delightful taste.

For we judge food by its flavor, and pills even though nutritious, are not likely to have the flavor of a steak smothered in mushrooms.

One of the newest chemical substances that will perk up, or enhance, food flavor is MSG. This is an abbreviation for monosodium glutamate. Now sold as pure white crystals, the chemical was known in a crude form by Orientals for centuries.

MSG is a natural protein product that can be made from vegetables or grain. It has no flavor of its own in the way that salt and pepper, for instance, do. But it does intensify the flavors already in food as well as bring out flavors that might otherwise remain hidden.

At one time gourmets in the United States could buy it under the name of "aji-no-moto." While its use in Chinese food and in canned and dehydrated soups is fairly well known, its possibilities in the preparation of home-cooked foods are not so familiar.

## Increases Saliva Secretion

MSG not only increases the secretion of saliva for some time, but also stimulates a tingling feeling in the mouth. To some, it has no taste at all. Even to most of these people, however, MSG does perk up the taste of foods to which it is added.

Because earlier preparations of monosodium glutamate, with a relatively low degree of purity, exhibited a meatlike flavor, the general belief existed that glutamate should be used as a seasoning for imparting meat flavors.

Continued refinement in production methods has been responsible for progressive increases in purity. Most of the MSG products available on the market today are over 99% pure. Only when the pure product became available was its unique property of accentuating natural food flavors fully appreciated.

## Glutamic Acid in Vegetables

To determine whether vegetables contained free glutamic acid, 16 varieties of canned vegetables of recognized brands and six kinds of fresh vegetables were

analyzed. They found that all contained glutamic acid, with mushrooms, peas and corn ranking highest. Fresh peas and fresh young sweet corn contained even more glutamic acid than older samples from the same field.

Meats, poultry and seafood analyzed revealed the presence of glutamic acid, also. Studies were made of chicken, seafoods such as salmon, tuna and clams, and meats such as roast beef, and meat products such as sausages.

Hominy, one of the vegetables studied, turned up without any glutamic acid. But researchers pointed out that hominy is made from mature corn which has less glutamic acid than young corn, and they said, the small amount of the acid which may have been in the corn might well have been washed out during the hominy process.

Cooked vegetables stored in the refrigerator kept most of their glutamic acid. Stored raw vegetables lost from 25 to 35% of their glutamic acid, most of it in the first 24 hours of storage.

As a result of these studies, it was thought that part of the superior flavor of young and freshly harvested vegetables may be due to their higher glutamic acid content. Also the glutamic acid in meats contributes

to their natural flavor.

## Undesirable Flavors Suppressed

The flavor-enhancing properties of MSG are retained indefinitely regardless of the length of time the food with which it is used may be stored.

On the other hand, undesirable flavors in certain foods are suppressed by monosodium glutamate. Such unwanted flavors include the sharpness of onions, the rawness in many vegetables and some meats, and the flavor of peel and earthiness in other vegetables, such as potatoes.

## Found in Proteins

Glutamic acid is one of the most common of the amino acids, being one of those found in practically all proteins. Wheat gluten is one of the richest and probably the most economical source of this amino acid. The proteins in wheat gluten contain approximately 40% glutamic acid.

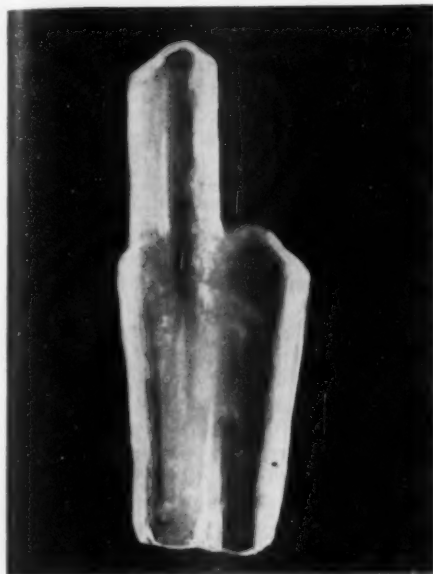
In one of the commercial methods for preparing MSG from wheat gluten, the protein is completely digested by boiling or autoclaving with strong hydrochloric acid. After filtering and adjusting the amount of acidity, glutamic acid crystallizes in long, white needles.

## Commercial Preparation

These crystals are then filtered off, purified and neutralized by dissolving in a solution of soda. This solution is then concentrated and allowed to crystallize over



**ENHANCES FLAVORS**—Added to almost any kind of food, monosodium glutamate perks up the taste, bringing out flavors that might otherwise remain hidden. Here it is tried on ham and eggs.



**MAGIC CRYSTAL**—From such protein-yielding sources as wheat spikes come the monosodium glutamate crystals which serve as the cook's fairy wand. The taste enhancing crystal is more than 99% pure.

a period of five to six days. The crystals of monosodium glutamate are then spray-washed and dried, after which they are ready for packaging.

The best flavor in food is one which appeals simultaneously to all of our flavor-detecting senses, i.e., odor, taste and feeling. An aroma is needed to make known the presence of the food, taste to entertain the tongue, and finally a pleasant combination of texture and tang to make us feel that the food is at its best in all ways.

If any of these sensory elements is missing the food is flat and uninteresting. It is the function of taste enhancers to supply the missing element or to heighten the effect of the elements already present. Monosodium glutamate does just this, yet does not have any taste itself.

To obtain for yourself a sample of monosodium glutamate as well as a new sweetening agent, sodium sucaryl, just introduced on the market and samples of other seasonings, write for the Taste Enhancers Unit of THINGS of science. Send 50 cents to Science Service, 1719 N Street, N.W., Washington 6, D.C. The supply of this unit is limited.

Science News Letter, July 15, 1950

#### MEDICINE

### Inferior Pancreas Main Cause of Diabetes

► THE main cause of diabetes is an inferior pancreas, with the inferiority of this organ being hereditary, Dr. Russell M. Wilder of the Mayo Clinic stated at the meeting of the American Medical Association in San Francisco.

"There is little evidence to support the view that stress imposed by hypophysis (pituitary gland), the adrenals or the thyroid accounts for the development of the clinical entity diabetes mellitus," Dr. Wilder said. "The normal healthy pancreas possesses a capacity which is adequate to meet demands for insulin created by all degrees of endocrine overfunction encountered clinically.

"Temporary failure occurs in many instances with resulting hyperglycemia (excess sugar in blood). However, from the fact that the diabetic state so provoked disappears when the hyperfunction of the insulin opponents is corrected, the inference is clear that the overfunction of the pancreatic beta cells has not led to their destruction. Exceptions may occur but they are most uncommon.

"On the other hand, overweight or the excessive consumption of food which leads to it, imposes a demand for insulin which not only exceeds the normal demand but is of long duration, extending usually over many years and thus may lead to beta cell destruction. However, only a small proportion of persons who are grossly overweight develop diabetes.

"Therefore, in those cases in which diabetes is provoked by overweight we can logically assume that the pancreas genetically was possessed of less capacity than normal from the outset.

"Furthermore, in very many instances of diabetes, including almost all cases of diabetes in childhood, we find no grounds for assuming the existence of a pancreatic overstrain of any kind. The causation of these cases must therefore rest entirely on inferiority, anatomic or functional, of the pancreatic beta cells. Diabetes in such persons follows stresses such as those imposed by growth, puberty, pregnancy, infectious disease, etc., the stresses to which all persons are exposed."

Dr. Wilder said the theory of a single

origin of diabetes receives support from studies of heredity in this disease.

"Diabetes behaves in heredity as if it were transmitted by a single gene (a hereditary factor which carries a transmissible character)," he said.

Science News Letter, July 15, 1950

#### PHYSICS

### Better Hearing for Music And Lectures in Same Hall

► SMALL communities can now have halls that can be used either for lectures or for musical performances with good hearing for both. And this even when the seats are the hard-to-sit-on but easily moved kind.

This promise of relief from bad acoustics in community-type halls is made by Dr. Paavo Arni of the Finnish Broadcasting Company in Helsinki. He describes a simple, inexpensive arrangement to accomplish this improved hearing in the JOURNAL OF THE ACOUSTICAL SOCIETY (June 6).

As much wall space as necessary is covered with a specially built adjustable absorbing unit. The absorbing unit, when open, exposes a layer of rockwool covered with a sheet of thin perforated plywood. Behind the rockwool there is a plywood sheet. This combination of materials plus air absorbs most of the usable sound spectrum.

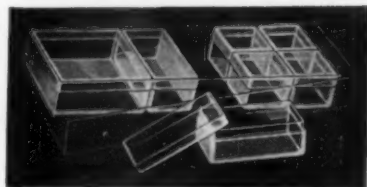
The absorbing unit can be rotated on hinges into a closed position, the absorbing surface disappearing. The reverse side of the absorbing unit, a hard glossy painted surface, is then exposed.

These units are placed one above another in two rows. The upper ones are all connected together with a steel rail; the lower ones may be individually connected to the corresponding units in the upper row. In this way all the variations of sound absorption desired may be obtained.

Science News Letter, July 15, 1950

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## ENGINEERING

# New Coal Mining Machine

► A NEW machine, now under successful development, to cut bituminous coal in the natural layers found in mines and load it on conveyors, gives promise of revolutionizing the coal mining industry.

It is known as the continuous mining machine and is a development in Huntington, W. Va., of the Mining Development Committee of Bituminous Coal Research, Inc. The committee of engineers and scientists has been at work for two years since organized March 30, 1948. It is headed by Gerald von Stroh, and its job is to develop machinery for use in mines that will lessen the cost of mining. This continuous mining machine is its initial project.

Many machines of various types and for various uses are already in use in American coal mines. Some are undercut devices to eat a channel into the face of the coal to make blasting easier. Others are powered drills using compressed air instead of the muscles of men. Still others are loaders to pick up the coal and put it on the conveyors that take it on the initial part of its trip to the surface. It is these machines, and others, that are behind the high production

rate per man per hour in American mining.

The new machine does all these things at the same time. The story of its development is included in a report issued by the responsible group. Somewhat similar machines have been developed by others and are under testing. Historically, a machine to do the same work was built and used in England for a short period about 80 years ago.

This new continuous mining machine can mine seams as low as 28 inches in thickness. It is 28 inches high, including four inches of ground clearance. Powered electrically, it employs rotors to do the cutting. Although a complicated device, with it one man can do the work which formerly required several, and safety is promoted by the elimination of explosives for blasting.

Cheaper coal should result from the use of continuous mining machines, Mr. von Stroh asserted at a recent mining meeting. If developments are maintained at the present rate, he said, cost reductions from one dollar to one and one-half dollars may be expected in the next 10 years.

Science News Letter, July 15, 1950

## ENGINEERING

# Safer Waterpower Project

► HUGE underground waterpower projects of the future will be virtually invulnerable to bombing, perhaps even to atomic attack, a U. S. engineering meeting was told in Pasadena, Calif.

It is often economically sound, even in peacetime, to build water power stations deep underground, the American Institute of Electrical Engineers heard.

Two officials of the State Power Board of Sweden, Ake Rusck and G. Westerberg, described underground hydroelectric stations already built in Sweden as the answer to power needs on rivers where high dams cannot be built.

These underground stations were built

for purely economic reasons, many of them long before World War II, the Swedish engineers pointed out. Higher water pressure was achieved, while upkeep on machinery rooms set in solid bedrock is much lower than above-ground power plants, they said.

"The safety attained thereby in time of war was a welcome extra advantage," their paper pointed out. By placing the turbo-generators and other machinery into deep rock rooms (the rock blasted out was used to fill the dams) the vital heart of the power installation was made virtually immune to air attack.

In a second paper on underground power plants, Paul E. Gisiger of Sao Paulo, Brazil, described a number of other installations already built or under construction in France, Switzerland, Italy and Sweden.

Science News Letter, July 15, 1950

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## PHYSICS

## Radio Stars Send Signals From Sky's Depths

► RADIO stars (not the kind that appear on radio programs) exist in interstellar clouds and are the origin of the radio signals that are known to come from the depths of the sky.

This new theory has been put forth by Drs. H. Alfvén and N. Herlofson of Sweden's Royal Institute of Technology in a report to PHYSICAL REVIEW.

The probable sources of heavenly radio waves are relatively large regions around almost dark stars. One of the latest theories of cosmic rays, suggested by Drs. R. D. Richtmyer and Edward Teller of the University of Chicago, makes almost every star have a field that traps the cosmic radiation that it generates. The Swedish scientists now visualize the electrons from this cosmic radiation creating the radio emissions that get to earth.

The radio stars emit very little light and are situated in interstellar clouds. They cannot be seen with ordinary telescopes. Unlike visible stars, they consist of a broad region in which radiations are produced. A typical radio star might be so large that it would take light a tenth of a year to cross it.

Science News Letter, July 15, 1950

## GEOLOGY

## U. S. Uranium Sufficient For Tomorrow's Industry

► URANIUM for tomorrow's industrial atomic energy can come from present-day U. S. deposits of fertilizers and oil shales, an Atomic Energy Commission geologist said in Los Angeles, Calif.

Dr. Robert J. Wright, in a speech before the Southern California section of the American Institute of Mining and Metallurgical Engineers, confirmed recent hints that Government teams have found large, low grade uranium reserves in this country.

There are "abnormally high concentrations" of uranium in deposits such as Florida's rich phosphate beds and the Chattanooga oil shale of the east-central United States, Dr. Wright said.

The world's uranium supply now comes from high grade, comparatively small pitchblende veins and carnotite ores. "It is impossible to predict how long the high grade reserves of uranium will hold out," said the AEC geologist.

He indicated, however:

1. Recent Canadian discoveries of rich uranium ores point to increasing output there.

2. New discoveries of pitchblende have been made in U. S. mines operated for other metals, as in the abandoned Caribou silver mine in Colorado in 1945 and in Idaho's Coeur d'Alene district last summer.

3. In at least two places, the small town of Marysvale, Utah, and in Portugal, it has been shown that secondary uranium minerals on the surface were hints to rich veins of radioactive ores deep underground.

The profitable utilization of each of these potential uranium sources Dr. Wright termed "a challenging problem for industrial science."

Science News Letter, July 15, 1950

## ENGINEERING

# Petroleum War Production

► THE AMERICAN petroleum industry is fully prepared to meet any and all foreseeable military emergencies with which this nation may be confronted, Frank M. Porter, president of the American Petroleum Institute, declared at a meeting recently. Domestic production can easily be increased some 20%, he said.

Domestic production of fuel oils can be stepped up immediately to over 6,000,000 barrels a day, he stated. This increase can be made without injury to the producing formations. The average daily production

from fields in the United States was 4,921,000 barrels through the first quarter of the present year.

Since termination of World War II, American interests have developed tremendous new petroleum reserves in Canada, South America and the Middle East. Petroleum for these would be available provided they are given proper military protection. Even without them, enough petroleum can be produced to meet both military and essential civilian uses, he predicted.

Science News Letter, July 15, 1950

## ENGINEERING

# Estonia's Oil Shale

► FACTS about the oil shale industry of Estonia, now behind the Iron Curtain, are revealed in a publication by the Engineering Experiment Station of Ohio State University. Liquid fuels from Estonian shale play an important part in Soviet programs.

The facts were gathered by Prof. O. Krumin, of the station staff, from scattered papers published in various languages, information from the Estonian Bureau of Mines, the U. S. Bureau of Mines, and many other sources. The facts are interpreted by him in light of visits to the mines in 1939 and 1940. The publication is pronounced unofficially by Dr. Simon Klosky, of the Bureau of Mines and an authority on European oil shale, to be of special value at the present time.

Russia has many known deposits of petroleum but their development has lagged as far as is known. Russia has also plentiful supplies of oil shale, distributed widely, according to Dr. Klosky. But the Estonian supply is probably the largest and most highly developed oil shale area under Soviet control today.

Estonian oil shale, Prof. Krumin states in his report, is called "kukersite" after the village where it was discovered. Information about it dates back more than 150 years. The Russian government, during World War I, took steps for its commercial utilization with only minor success. During the German occupation in the World War II era, output was increased considerably and aided Hitler in his campaigns. However, the actual industrial research, the mining of the shale and the production of oil on an industrial scale began after World War I when Estonia was an independent state.

The productive area of the Estonian oil shales is approximately 75 miles long and 18 miles wide. Most of the mining is underground work at a depth of about 60 feet. German estimates, made during World War II, set a figure of 5,000,000,000 tons of

oil shale reserves, enough to supply the peacetime needs of what was then Germany for 300 years.

A particularly important fact about Estonian oil shale is that it is said to contain recoverable uranium, number one essential in atomic energy. If so, then the large quantities of spent shale dumped around

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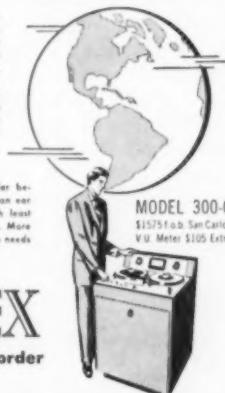
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the Estonia oil shale plants will become a valuable and easily available source for extraction of uranium, Prof. Krumin declares.

Science News Letter, July 15, 1950

## PHYSICS

## Test Aerial Camera With Moving-Eye Lens

► A MOVING lens for aerial cameras which follows the landscape just as the eye does is being tried out by the Air Materiel Command at Wright Field in Dayton, Ohio. If it works it might well cut down on the bulkiness of many of the newer cameras used in aerial photography.

In the newly designed camera, during each exposure the lens moves across the focal plane shutter at the speed at which the ground is passing by under the plane. Compensation is effective up to 500 miles per hour and at ranges as close as 150 feet. The camera is expected to be most effective for side oblique photography at low altitudes and under poor light.

The moving lens, if it works out, would allow for longer time exposures and thus would permit doing away with the complicated and bulky equipment necessary for extremely short exposures.

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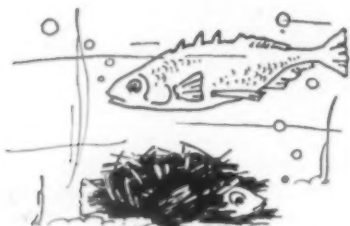
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► **STICKLEBACKS** are small fish with sharp spines sticking up on the back. These spines vary in number from two or four to nine, depending on the species.

The stickles bristling from the fishes' backs have a distinctly thorny and belligerent appearance. This is not a deception, since sticklebacks are not at all backward in using the spines as deadly weapons, especially during the breeding season.

This takes place during the spring and early summer. At this time the males take on bright nuptial colors with which to bedazzle their future mates.

Full of confidence in the magnetism of his new courting colors, the male first sets to work building a home. Properly speaking, it is not a home but a love nest, for it is destined to be no more than the transitory hideaway where a stickleback brings to fruition his midsummer madness.

Transitory or no, the male builds the nest with extreme care. Bits of roots and stems of aquatic plants are his building blocks, and for mortar he uses a sticky substance secreted in his kidneys which he wipes off by swimming against the part to be cemented.

The nest so constructed is barrel- or muff-shaped. The fish constantly tests the strength of his structure, butting against it here and there, reinforcing any section that dissatisfies him. To secure the nest he scoops up sand in his mouth and scatters it about the floor of the nest.

When the nest is finally just the way he wants it, possibly after as much as several days' steady work, the stickleback goes in search of a mate. When he finds one, he leads her to his nest and then either gently coaxes or rudely pushes her inside. There she lays her eggs and swims off, and the male promptly fertilizes them.

And then with the same singlemindedness that has characterized all his actions up to now, off he goes to find another mate, to repeat the cycle again, and again, and possibly still again, until there are enough eggs to satisfy his yearnings for parenthood.

From then on until the small fry are

big enough to fend for themselves, Mr. Stickleback keeps an endless vigil. He circles the nest, keeping it in repair, and violently attacking any other fish, large or small, that ventures in the vicinity.

Even after the eggs hatch out, he continues the watch, keeping the tiny offspring

in the nest, warding off all dangers. It is only when the young sticklebacks have become strong swimmers and stand some chance of eluding capture that the sentinel indifferently takes leave forever of the family he strove for so ferociously.

Science News Letter, July 15, 1950

#### MEDICINE

## Hormones for Arteries

► **CORTISONE** and **ACTH**, the two hormones that have brought dramatic results in arthritis, now show promise in two artery diseases, periarthritis nodosa and cranial arteritis.

Seven patients given one or the other of these hormones all got "prompt subjective relief," Drs. Richard M. Schick, Archie H. Baggenstoss and Howard F. Polley of the Mayo Clinic reported to the American Heart Association in San Francisco, Calif.

The two diseases are inflammatory conditions of the walls of arteries. The fever which comes with this condition subsided in 24 to 72 hours after the patients were given cortisone or ACTH. Blood sedimentation rates, elevated in the disease, decreased to normal but more gradually than

the temperature.

Partial relapses occurred in five patients after the hormones were stopped. The other two are still on their first course of treatment.

Two of three patients who were critically ill died of heart and kidney failure, though they improved at first. The other has severe and progressive high blood pressure. Autopsy examination of the two who died showed complete healing of all the diseased places on the arteries, but in the process of healing, the arteries were closed by fibrous tissue formation. This caused widespread damage to internal organs deprived of their blood supply when the arteries were closed.

Science News Letter, July 15, 1950

#### MEDICINE

## Female Growth Hormone

► **A LITTLE** known hormone has demonstrated the ability to stimulate body tissue growth without producing whiskers and other masculinizing effects in women.

The hormone, a steroid called methyl androstenediol, may prove to be widely useful in the treatment of diseases occurring in women which are accompanied by a general wasting of body tissue, such as Simmond's disease and rheumatoid arthritis.

Discovery of the growth-producing properties of the hormone was reported to the meeting in San Francisco, Calif., of the Association for the Study of Internal Secretions by three University of California Medical School physicians, Dr. Gilbert S. Gordon, Dr. Eugene Eisenberg, and Dr. Henry D. Moon.

Physicians have sought a hormone with the properties of methyl androstenediol for many years. Testosterone has been used successfully in tissue building, but its use has been limited by its undesirable side effects, particularly masculinization in women. The growth hormone, while very effective in rats, does not appear to promote growth in man in its present form.

As a step in the search by the University of California group, Dr. Eisenberg developed a test for quickly measuring the tissue-building properties of compounds. He found that the levator ani muscle is an accurate indicator of growth promotion.

This muscle is undersized in castrated animals. If a compound injected into cas-

trated animals has growth-promoting properties, the muscle increases in weight.

When castrated animals were given the hormone for as long as a week, it was found that this muscle was restored to normal or greater than normal weight. Moreover, there were no apparent sexual side effects of the hormone.

The hormone has been tried on human subjects, and preliminary results indicate that the compound has similar results in man.

Science News Letter, July 15, 1950

#### PHYSICS

## Cosmic Rays from Sun? Chicago Tests to Tell

► **EVIDENCE** that the powerful cosmic rays bombarding us from outer space do actually come from the sun may result from research.

Dr. Marcel Schein and J. J. Lord of the University of Chicago are studying how the intensities of some of these cosmic rays change during 24 hours. He finds that bombardment by heavy nuclei of low energies is much more frequent during the day than at night.

If this same finding applied to heavy nuclei of higher energies as well, the theory that cosmic rays originate from the sun would be substantiated.

Science News Letter, July 15, 1950



# Books of the Week

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**ATOMIC PHYSICS**—Wolfgang Finkelburg—*McGraw-Hill*, 498 p., illus., \$6.50. Covers the whole field of nuclear, atomic, molecular and solid-state physics from the atomistic point of view. Translated from the Revised German Edition by George E. Brown.

**THE EARLY DEVELOPMENT OF THE CONCEPTS OF TEMPERATURE AND HEAT: The Rise and Decline of the Caloric Theory**—Duane Roller—*Harvard University Press*, 106 p., illus., paper, \$1.25. Case 3 in the Harvard Case Histories in Experimental Science, which attempt to recapture the experience of those who once participated in exciting events in scientific history and thereby impart to the social science student an understanding of science.

**THE GALLINAZO GROUP VIRU VALLEY, PERU**—Wendell C. Bennett—*Yale University Press*, 127 p., illus., paper, \$2.00. A study of one large group of ruins in the Viru Valley representing only the Gallinazo Period, recognized as one of the most distinctive cultures which existed in the Valley.

**GRAIN**—FAO Distribution Division, Cereals Section—*Food and Agriculture Organization of the United Nations*, Commodity Series, Bulletin No. 18, 116 p., illus., paper, 50 cents. The 1949-50 world grain situation is reviewed. World trade tables for each of the principal grains are included.

**THE GROUND SUBSTANCE OF THE MESENCHYME AND HYALURINIDASE**—F. Duran-Reynals and others—*New York Academy of Sciences*, Vol. 52, Art. 7 of the Annals, 264 p., illus., paper, \$3.00. Contributions from the fields of chemistry, enzymology, histology, physiology and clinical medicine to the same problem.

**HOME NURSING TEXTBOOK**—Nursing Services, American Red Cross—*Blakiston*, 6th rev. ed., 225 p., illus., paper, 60 cents. (Cloth. \$1.00). This new revision of the best seller provides more detailed instructions for home nursing. Increased material on care of the elderly and selected additional references for those who wish to study further are included.

**INORGANIC SYNTHESIS**, Vol. III—Ludwig F. Audrieth—*McGraw-Hill*, 230 p., illus., \$3.75. Detailed procedures of preparing 53 important compounds which are in many instances not obtainable readily or directly from commercial sources.

**INTERNATIONAL LABOR DIRECTORY 1950**—Dominic DiGalbo, Ed.—*Claridge*, 864 p., \$25.00. A compilation of approximately 132,000 listings covering the labor movement and organizations associated with it.

**LIFE HISTORIES OF NORTH AMERICAN WAGTAILS, SHRIKES, VIREOS, AND THEIR ALLIES**—Arthur Cleveland Bent—*Gov't. Printing Office*, Smithsonian Institution Bulletin 197, 411 p., illus., paper, \$1.50. This is the eighteenth in a series of bulletins of the U. S. National Museum on the life histories of North American birds.

**MEASURING WATER IN IRRIGATION CHANNELS WITH PARSHALL FLUMES AND SMALL WEIRS**—R. L. Parshall—*Gov't. Printing Office*, U. S.

Dept. of Ag. Circular No. 843, 62 p., illus., paper, 25 cents.

**MOST OFTEN NEEDED 1950 RADIO DIAGRAMS AND SERVICING INFORMATION**—M. N. Beitman, Ed.—*Supreme*, 192 p., illus., paper, \$2.50. Diagrams and service material on AM and FM sets prepared with the cooperation of various radio manufacturers.

**THE NUTRITIONAL IMPROVEMENT OF LIFE**—Henry C. Sherman—*Columbia University Press*, 270 p., \$3.75. A presentation of the important advances made in the last half century in the four major fields of nutrition: energy foods, proteins and their amino-acids, the mineral elements and the vitamins.

**A PRACTICAL SURVEY OF CHEMISTRY**—Walter S. Dyer and Manfred E. Mueller—*Holt*, rev. ed., 564 p., illus., \$3.60. A nonmathematical introductory text.

**PRACTICAL TELEVISION ENGINEERING**—Scott Helt—*Murray Hill*, 708 p., illus., \$7.50. Tells how television transmitters and receivers work, and how they are combined in the complete television system.

**PUBLIC-ADDRESS GUIDE**—Guy S. Cornish—*Radcraft*, Gernback Library No. 41, 80 p., illus., paper, 75 cents. Information on operation and maintenance of public address systems for the radio service technician.

**SPEAKING CAN BE EASY FOR ENGINEERS, TOO**—Committee on Relations With Industry—*Engineers' Council for Professional Development*—24 p., illus., paper, 50 cents. Presenting helpful hints.

Science News Letter, July 15, 1950

## ZOOLOGY

### How Octopus Learns Is Clue to How Man Learns

► **STUDY** of how an octopus learns is providing scientists with new knowledge of what goes on in the nervous system of higher animals.

A common plan of organization can now be detected in learning systems of cephalopods and mammals, Prof. J. Z. Young of University College in London told the Royal Society in the Ferrier Lecture.

It has been difficult, Prof. Young noted, to find out just what happens in the nervous system during learning, because the process is not localized but is generalized through large masses of tissue.

Much evidence has been found to indicate that more stable learning depends on the formation of new nervous pathways by some form of growth process.

The relationships of fibers in the closely woven networks of the higher centers is constantly being changed slightly by activity. These changes alter the direction of nervous impulses.

Science News Letter, July 15, 1950

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❁ **SELF-STERILIZING** nylon, for use in toothbrushes, combs, teething rings and other solid objects, is impregnated with an aryl mercuric compound in the presence of nitric acid. This recently patented process makes the article in which used a long-life bacteria-killer.

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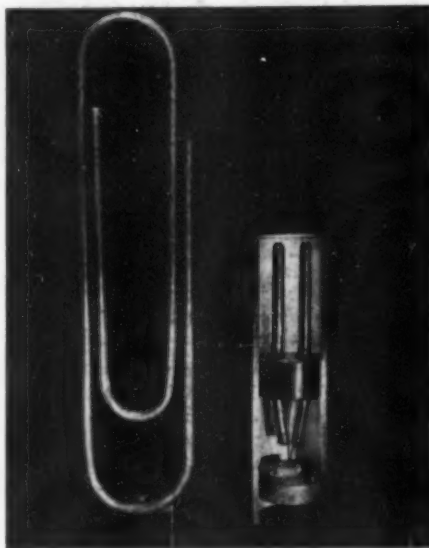
❁ **POWERED GRINDER** for the laboratory revolves the mortar or grinding bowl, electrically while a weighted arm holds the pestle grinder and swings it back and forth in the bowl. It handles laboratory solids faster and more efficiently than the hand mortar-and-pestle method.

Science News Letter, July 15, 1950

❁ **FIRE ALARM** system, for industrial installations, automatically gives a local "heat" warning if the temperature exceeds a predetermined safety point and later summons the fire department if the heat surges beyond. It is a continuous line of plastic-insulated copper tubing carrying a light electric current.

Science News Letter, July 15, 1950

❁ **TRANSISTOR**, a tiny metal tube shown here beside a paper clip, has the ability to amplify electrical currents in much



the same way as the electronic vacuum tubes found in all radio sets. Its secret is a crystal of the element germanium.

Science News Letter, July 15, 1950

❁ **FREEZE-DRYING** apparatus, which uses infra-red rays as a heat source, speeding up the process at least 10 times, was developed to produce a particular drug but

has many applications. The process consists basically of a frozen solution to be dried, a vacuum tank, and a heat source.

Science News Letter, July 15, 1950

❁ **FLASHER LIGHTS**, for use at night on private and executive planes, come in a complete kit for easy installation and meet the new governmental requirements for flashing lights during darkness. The device has only one moving part, and operates on 12- or 24-volt electric systems.

Science News Letter, July 15, 1950

❁ **COTTON SEED CLEANER**, to remove trash and other foreign matter from the seed during ginning, consists of two cylinders, one within the other, the cotton to be cleaned passing between them. Jets of air, entering through openings in the outer cylinder, blast foreign material from the cotton locks.

Science News Letter, July 15, 1950

❁ **CEPHALOMETER** is a type of X-ray apparatus devised to make scientifically accurate "pictures" of the exterior and interior head and face. With it, scientists hope to be able to detect early, and correct, dental and facial irregularities which lead to disfiguring growths.

Science News Letter, July 15, 1950

## Do You Know?

The leading cause of fatal injuries in coal mines is falling roofs.

New Zealand stands first among the nations of the world in the average age to which its population lives.

Iceland's golden plover is quiet and almost invisible on its nest in the mossy tundra but is a noisy conspicuous bird when on the wing.

True gold will not dissolve in diluted nitric acid but "fool's gold" will; the latter is iron pyrite but it looks like gold and has fooled many.

A chemical amino compound called ortho biphenyl biguanide, added to soap in the making, prevents the product from rancidity and discoloration.

Compound 1080, chemically sodium fluoroacetate, is an excellent poison for rats but can not be safely used except by experts because it is a dangerous poison to man and other animals.

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